

## PROJECT OBJECTIVES

Boston University, Abengoa Solar, and Sandia National Laboratories are working together to develop the electrodynamic screen (EDS) as a self-cleaning technology for solar concentrators. The EDS uses traveling-wave electric fields to move dust particles across the surface of the collector, ultimately removing them entirely.

Large-scale solar concentrators are best situated for semi-arid and desert regions of the earth, where sunlight is abundant. These regions, however, are also very dusty. When dust deposits on solar collectors, it obscures reflection and reduces energy yield.

EDS can remove dust with more than 90% efficiency in less than 2 minutes using a very small fraction ( $< 0.1\%$ ) of energy produced by the solar collectors, without requiring any water or manual labor.

Milestones: Conduct fundamental studies and establish feasibility

## APPROACH

- Fundamental Studies on Electrodynamic Dust Removal process
- Analysis of Dust Related Losses in CSP Plants
- Production and Testing of EDS integrated Mirrors for Self-cleaning Properties
- Perform Cost-Benefit Analysis
- Develop a Comprehensive Model and Demonstrate Feasibility

<sup>3</sup>Reference

<sup>4</sup>Reference

## KEY RESULTS AND OUTCOMES

- Prototype EDS integrated Mirrors are being developed as self-cleaning CSP optics.
- Laboratory testing of the Prototype EDS plates are in Progress
- The project aims to quantify and assess the technological and commercial viability of EDS-incorporated collectors as a means for maintaining high optical efficiency of solar concentrators located in semi-arid and desert regions.

- **Model Development**
- **Develop 12 EDS integrated Glass Mirrors**
- **Complete Laboratory Evaluation of EDS**
- **Begin Field Testing**
- **Perform Manufacturing and Operational Cost Analysis**